Constant Pressure/ Constant Current

Digital Power Supply Introductions

Model: DPS3003/DPS3005/DPS5005/DPS8005   version: 2019-3-15

Dear users, thank you for purchasing the constant Voltage/constant Current digital power supply produced by HANGZHOU RUIDENG TECHNOLOGIES CO., LTD, in order to let you know more about the full function of this product, get a better experience and avoid misuse. Please spend some time on reading this introduction. Keep it for checking again. (Please pay attention to these red sentences)

1. Production Introduction

1.1 Production Synopsis

This product combines analog adjustment and digital control, at the same time it is compact and powerful, and becomes the first choice for many enthusiasts and laboratory workers. The unit offers non-volatile power off parameter storage and 10 programmable preset memory Data Groups with a shortcut recall function for groups 1 and 2. All these productions are designed with LCD display, so we can check set Voltage, set Current, output Voltage, output current, output power, input Voltage and so on. On the right side of the main interface, we can see output enabled or disabled, Constant Current or Constant Voltage mode of operation, abnormal condition warning, keypad locked or unlocked state and the Data Group in use. The data setting interface allows adjustment of Over-Current, Over-Voltage and Over-Power protection values, Preset value, LCD brightness and whether the power is turned on or the like.

This product has 3 versions, Non-communication version, USB communication version, USB + Bluetooth communication version. Communication version can be connected to PC, Bluetooth version can be connected to Android mobile phone. (Note: DPS3003 only has no communication)

This product has many advantages, small size, advanced function, good visual effect, high operability, high-precision, it can be used independently or be inset into the device and been widely applied.

1.2 *Series Product Parameters*

Model Name	DPS3003	DPS3005	DPS5005	DPS8005
Input Voltage range	DC6-40V	DC6-40V	DC6-55V	DC10-90V
Output Voltage range	0-32.00V	0-32.00V	0-50.00V	0-80.00V
Output power range	0-96W	0-160W	0-250W	0-408W
Output Current range	0-3.000A	0-5.000A	0-5.000A	0-5.100A
Output Voltage accuracy	±(0.5%+3 digit)			

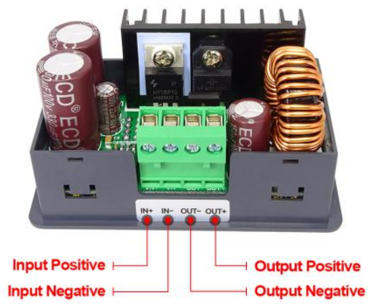
Output Current accuracy	±(0.5%+5 个 digit)			±(0.8%+5digit)
Output ripple typical	100mV VPP			150mV VPP
Output Voltage resolution	0.01V			
Output Current resolution	0.001A			
Display module open size	71*39mm （Different hardness and thickness materials will be different, please test before batch use）			
Power module size	79*43*41mm	79*43*47mm	79*43*48mm	79*43*55mm
Weight(packet included)	85g	108g	121g	138g

Note: the following description uses the **DPS8005** as an example. Other models have same functions and operation except for parameters.

1.3 Connection Description

IN**+**: Input positive IN - : Input negative

OUT**+:** Output positive OUT- : Output negative



The module is DC-DC step-down output. It must ensure that the input Voltage is 1.1 times higher than output Voltage. Under natural heat dissipation conditions, it can be output at full load. Please install a fan in the casing.

DC 90.00V is the maximum input Voltage limit and AC or AC Mains supply 220V must **NEVER** under any circumstances be connected to this unit . Do not reverse the battery when charging. Incorrect use will cause the product to burn out. Please strictly follow the above wiring instructions and precautions.

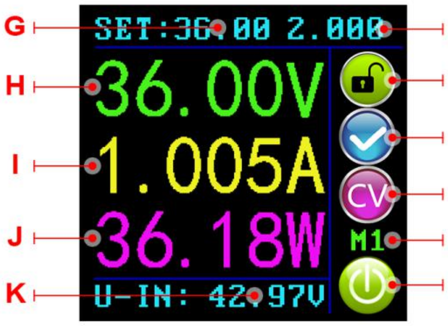
Exceeding the limit Voltage, using AC as input, wiring error and battery charging reverse will cause damage. Some damage is irreversible, so be careful when using the module.

1.4 Panel Description



A: Voltage setting/Up Arrow/Shortcut to recall M1 Data Group.
B: Data entry /Extract data from the specified Data Group
C: Current setting / Down Arrow / Shortcut to recall M2 Data Group.
D: 1.44 inch full color LCD screen.
E: Rotary control / Data adjustment / Keypad lock.
F: Output On / Off.

1.5*Display Interface Description*



The main interface



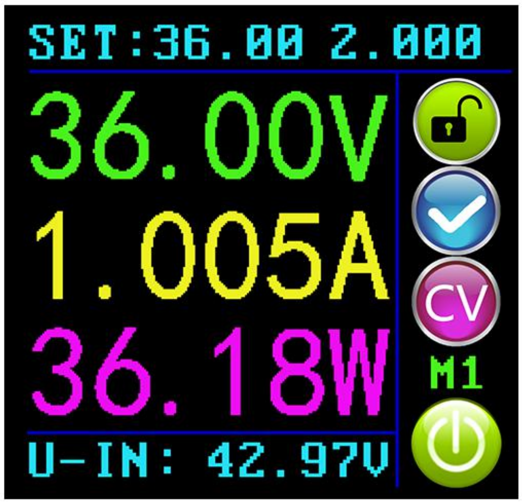
Data setting interface

G:The preset value of the output Voltage	L:The preset value of the output Current Limit
H:The actual value of the output Voltage	M: Keypad locked or unlocked prompt
I:The actual value of the output Current	N:Normal or abnormal status prompt
J:The actual value of the output Power	O:Constant Voltage or Constant Current status prompt
K:The actual value of the input Voltage	P: Data Group number in use prompt
Q: Output enabled or disabled prompt	
R:Preset Output Voltage	V:Preset Over-Power protection value
S:Preset Output Current	W:Preset screen brightness level
T: Preset Over-Voltage protection value	X: Preset Data Group number.
U:Preset Over-Current protection value	Y:The actual value of the output Voltage and output Current

1.6 Operating Instructions



Welcome window



Main interface

When the unit is first powered on, the Welcome screen is displayed followed shortly by the Main Interface screen.

1.6.1 Fast Voltage and Current Setting

Press **V/↑** key to enter the fast Voltage setting mode. Press the rotary control to cycle through the characters available, place the cursor at the required character, turn the rotary control clockwise increases the value and anticlockwise decreases the value. Press **V/↑** key to save the data and exit, alternatively, after 1 minute of inactivity the setting mode will exit automatically. Press **A/↓** key to set the output Current limit using the same procedure.

1.6.2 Advanced Parameter Setting

In the main interface press the **SET** key to enter the Data Setting Interface. In the Data Setting Interface press **V/↑** key or **A/↓** key to step up or down through the menu options to select **U-SET**(Voltage) or **I-SET** (Current Limit),and then set the output Voltage and output Current Limit in the same way as used in the main interface.

1.6.2.1 Protection Values Setting

Switch to **S-OVP** (Over-Voltage Protection), **S-OCP** (Over-Current Protection) or **S-OPP** (Over-Power Protection) limits. We can set the value of Over-Voltage protection value, Over-Current protection value and Over-Power protection value. When any of the protection value limits are reached ,the output will be automatically disabled, and there will be OVP OCP OPP displayed on the interface; When the temperature of Power board exceeds 80 ℃ ,the output will be automatically disabled, and there will be OTP displayed on the interface. Press the rotary control to place the cursor at the required character, and turn the rotary control to set the value. Press **SET** key to exit.

1.6.2.2 Screen Brightness Setting

Switch to **B-LED**, press the rotary control to select the character you want to change. Turn the rotary control to adjust the brightness from 0 to 5 where 0 is the darkest and 5 is the brightest. Press **SET** key to exit. It's up to you to set the brightness you like.

1.6.2.3 Data Settings and Saving In Specified Data Group

Switch to **M-PRE** ,press the rotary control to select Data Group Number, press **SET** key and then press **V/↑** key or **A/↓** key to step up or down through the menu options, press the rotary control to set the value you need. Press **SET** key for over 2 seconds and the data will

be saved in this Data Group.in the meanwhile the Data Group Number is shown on the right hand side of the screen. Press SET key to exit.

1.6.2.4 M-PRE ON / OFF Setting

Switch to M-PRE , press and turn the rotary control to Data Group Number you want to check, then all the data will be shown to you, press rotary control again so that you can adjust M-PRE option. Turn the rotary control to select either ON or OFF. When ON is selected it signifies that when the Data Group is recalled the state of the unit main output will remain the same as it was prior to the Data Group recall. When OFF is selected it signifies that when the Data Group is recalled the state of the unit main output will be set to OFF regardless of previous setting.

1.6.2.5 Output Status Setting

Switch to S-INI , press and turn the rotary control to select either ON or OFF. When ON is selected, the device will Power on with the Output enabled. Selecting When OFF is selected, the device will Power on with the Output disabled.

1.7 Function Description

1.7.1 Enable or Disable the Output

At any time you can press key to enable or disable the Output when the keypad is unlocked.

1.7.2 Locking the Keypad to Avoid Accidental Operation.

At any time you can hold the rotary control for more than 2 seconds to lock the keypad, there will be displayed on the right side of the interface; hold the rotary control again for more than 2 seconds you can unlock the keypad, there will be displayed on the right side of the interface.

1.7.3 10 Data Groups Preset（M0-M9）

The M0 Data Group is the default Data Group after power on. It should be noted that any time an alternative Data Group is selected or any changes made to the existing settings then M0 will be immediately overwritten with the newly selected data.

1.7.4 Shortcut Keys to Select and Recall M1 or M2 Data Group

Hold V/↑ key or A/↓ key for over 2 seconds to shortcut recall the M1 or M2 Data Group, and there will be Data Group Number displayed on the right side of the interface.

1.7.5 Select and Recall Any Specific Data Group.

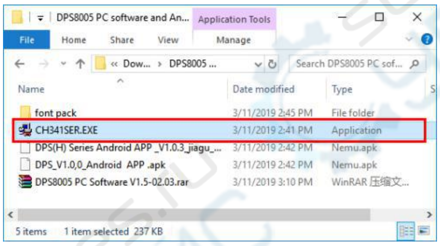
Hold SET key for over 2 seconds, there will be Data Group Number displayed on the right side of the interface. Turn the rotary control to select the required Data Group (M1 to M9) , then press SET key to activate the selected Data Group.

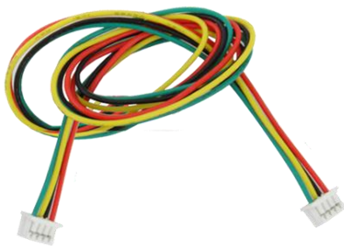
2. Introduction of Communication version

This product communication follows the MODBUS RTU protocol and can be connected throght USB or Bluetooth. The two communication methods cannot be used at the same time. If you need secondary development, communication protocol . Download address is detailed in section 2.4. (You must download the file from the link we provided)

2.1 Driver Installation

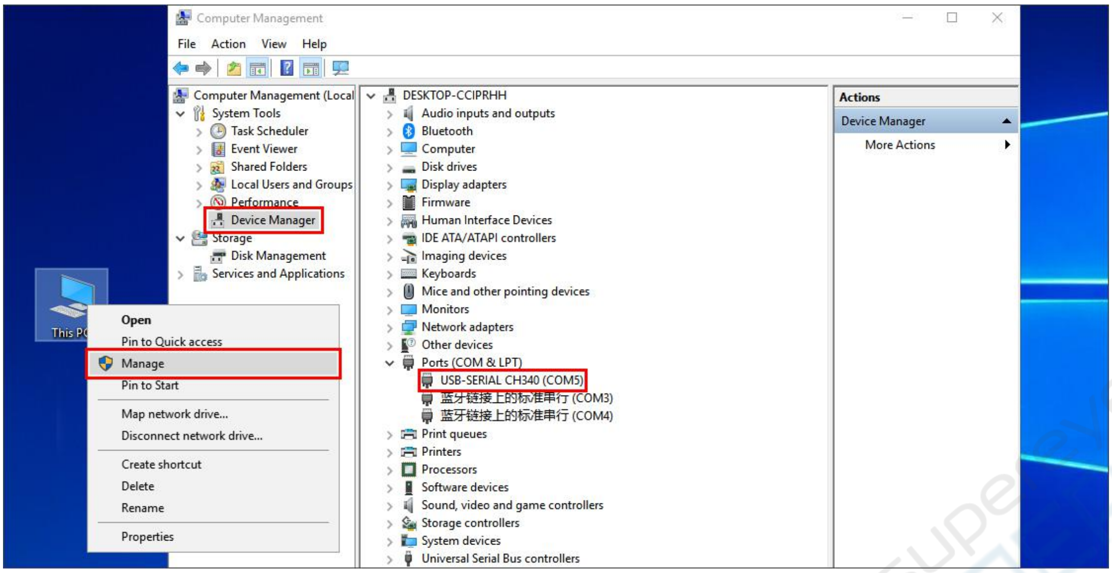
Open the file and double-click CH341SER.EXE to install the communication board driver.



When the driver is installed, connect digital power supply and communication module (as shown below) with cables, then connect the computer through the Micro USB cable. Right click “MY COMPUTER”, then click "Manage" -"Device Manager" and click the drop-down arrow at "Port" to see the module's COM port number (as shown below).

Note: If the USB communication module is abnormally disconnected, you need to re-select the COM port of the host computer software to connect normally.



2.2 Digital Power Communication Parameter Setting

Hold V/↑ key and then turn on the power to enter the communication parameter setting interface, press V/↑ key or A/↓ key to select the parameter, and then press the rotary control to enter the data modification. After setting the data, press SET key twice to exit, the communication parameters will be saved automatically.

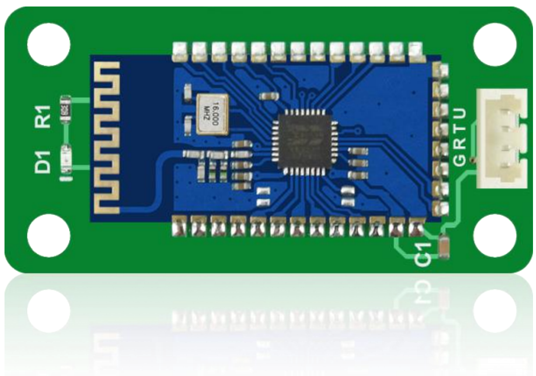
COMM: communicate switch setting, ON means to turn on communication, OFF means to turn off communication.

ADDR: address code of digital power supply, range 001-255, default 001 (it won't be used unless multi-machine communication).

BAUD: communication Baud-rate, 2400, 4800,9600,19200 can be chosen.

BPIN: Bluetooth pairing code, 0000-9999, default 1234, it is used when connecting to Bluetooth.



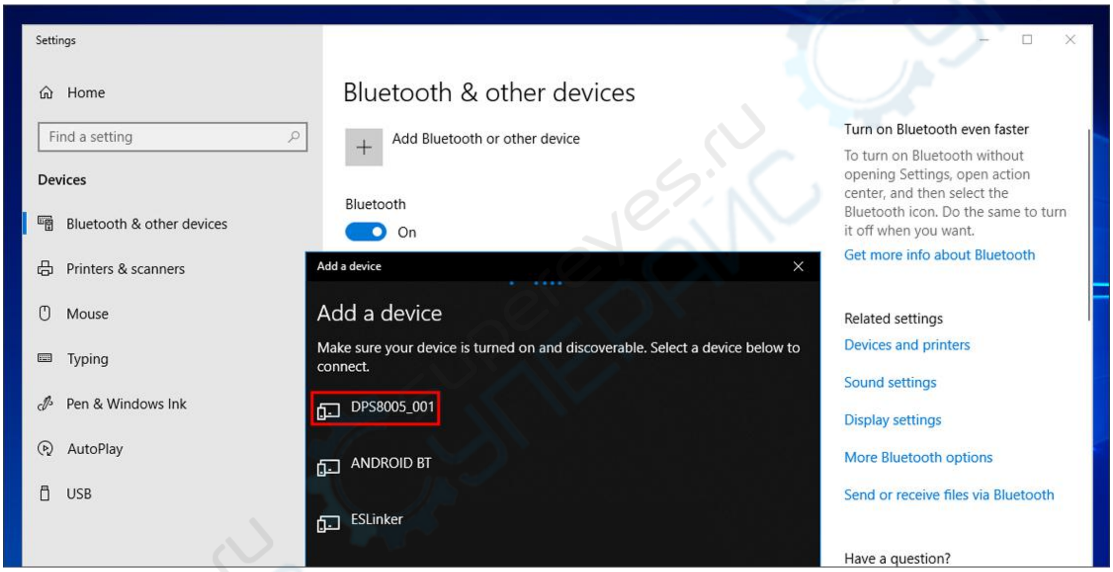


Communication Parameter Setting Interface

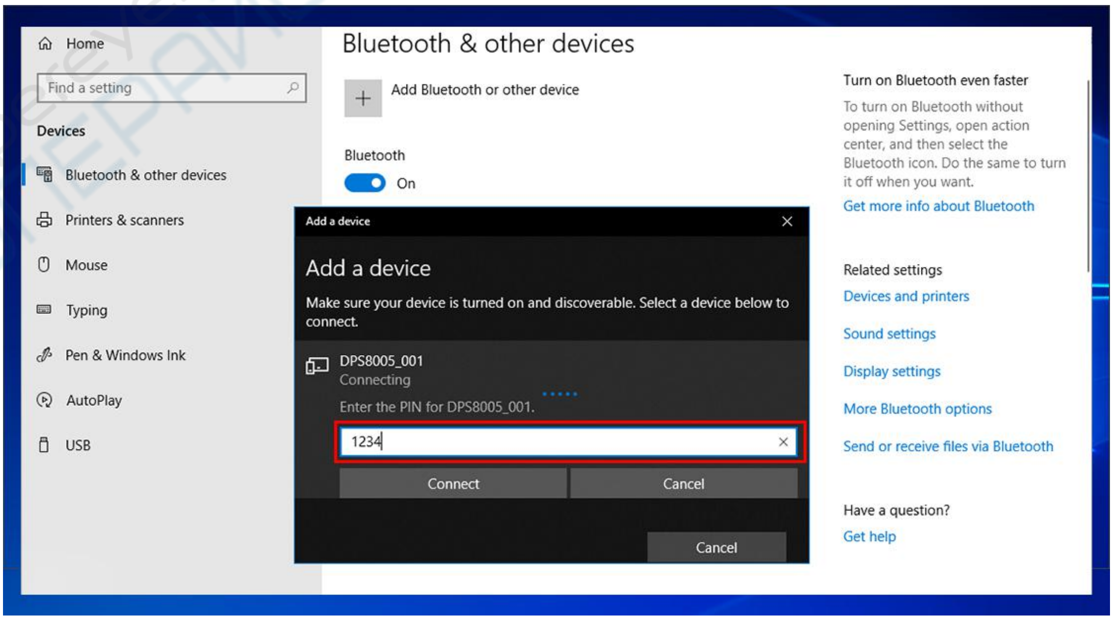
2.3 Bluetooth Communication

The Bluetooth communication module follows the V2.1+EDR Bluetooth specification, connect digital power supply and communication module with cables (you need to enter the communication setting interface to initialize the communication parameters of the Bluetooth module if it is the first time to use Bluetooth communication function).The red LED of Bluetooth communication module starts to flash after the digital power is turned on, that means the Bluetooth can be searched. Open the Bluetooth of your computer, right click on the Bluetooth icon to add the device. Laptop can use its own Bluetooth, desktop can use the recommended USB Bluetooth adapter, the USB adapter driver will be automatically installed after plugging in the desktop. You can see Bluetooth icon appears in the desktop status bar (lower right corner).

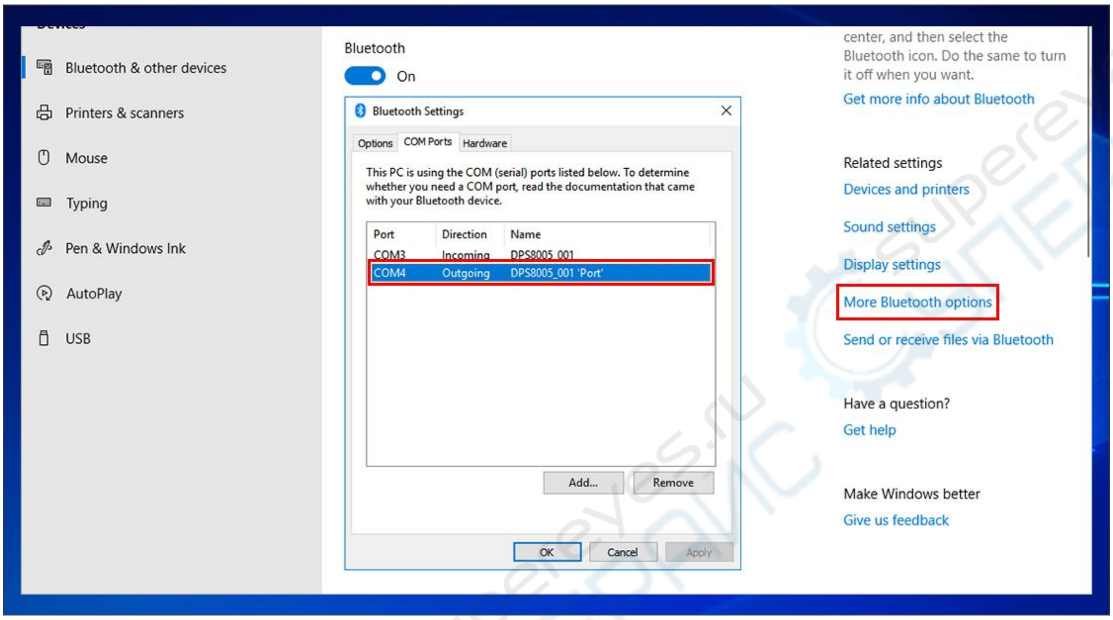
Search for a Bluetooth device. The last three digits of the device represent the digital power address code.



Enter the device's pairing code when connecting to Bluetooth. Default 1234.



Select the connected Bluetooth device, check the Bluetooth serial port COM that the computer is using, and the COM port of the outgoing direction (DPS5015_001'Port') is the serial port of the Bluetooth connection.(Note: Win 7 system, select the Bluetooth device, right click to view the properties, display the following window, view the COM port of the Bluetooth settings, select the "outgoing direction" serial port to connect; Win 10 system, select the Bluetooth device, click "More Bluetooth option", the following window is displayed, view the COM port of the Bluetooth setting, and select the serial port to connect in the outgoing direction.)



Note:

The power supply voltage of communication interface is DC 3.3V and power supply ability is limit. Don’t connect other big power Bluetooth or WIFI module, otherwise it will be burnt.

When using the Bluetooth communication function, if power off for digital power supply, you need to choose COM interface to connect Bluetooth module again after power on.

If the LED on Bluetooth module is flashing, it shows it is on the state of disconnection. If LED is lighting, it shows it is on the state of connection.

When using Bluetooth function, don’t put Bluetooth module in the metal box, otherwise it will affect signal strength, Bluetooth communication distance is up to 10 meters in an open and unobstructed condition.

When modifying communication data of digital power supply, you must disconnect Bluetooth with PC, the LED will be flashing. Otherwise you can change the data of Bluetooth board.

For computer operating system, please install official version. if you install pirated or lite operating system, there may be a lack of Bluetooth virtual serial port driver on those operating system, and the system can’t assign COM port to Bluetooth board. And it can’t communicate with the upper computer.

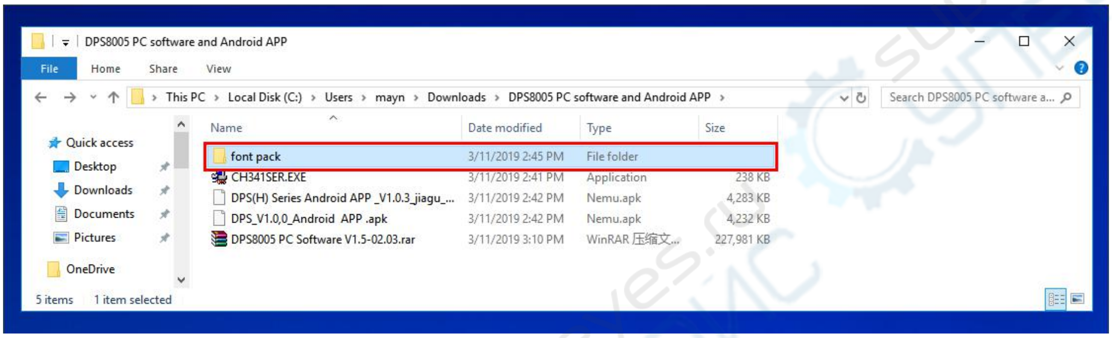
Do not touch components on the Bluetooth communication module, they are fragile and can be easily broken.

2.4 Installed the Computer Software

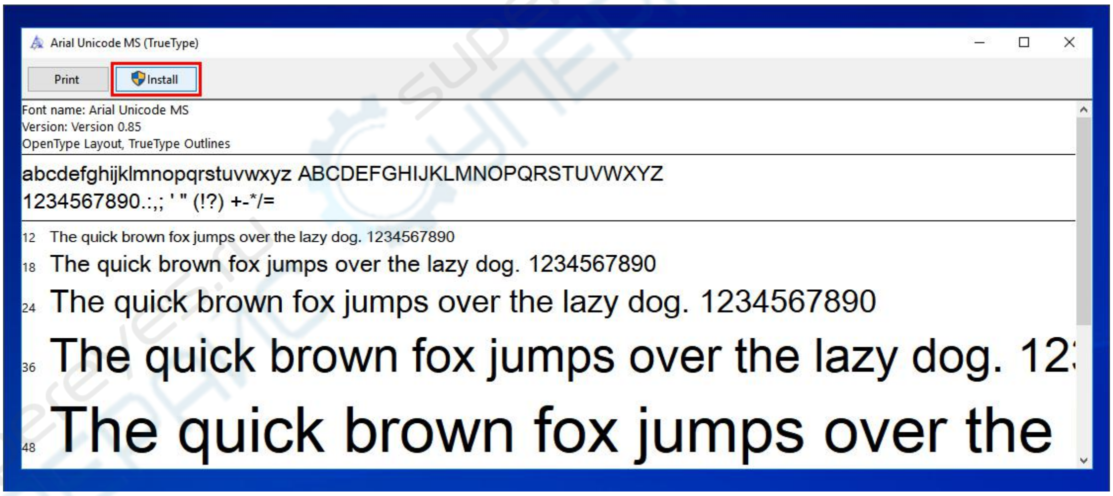
Please download file one by one,do not download all files at the same time,otherwise you will be

charged.
Note: this software can only work on Win7 or above.
DPS3003: file download link: (no communication function)
DPS3005: file download link:
http://www.mediafire.com/folder/1qtg8k2c03llj/DPS3005_file
DPS5005: file download link:
http://www.mediafire.com/folder/napmdzd4qt2dt/DPS5005_file
DPS8005: file download link:
http://www.mediafire.com/folder/i1766ch7ec97a/DPS8005_file

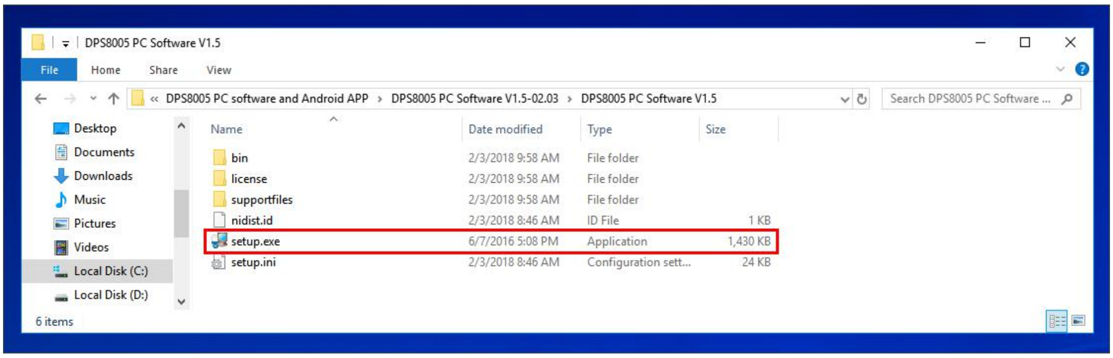
2.4.1 Open and Unzip the PC software

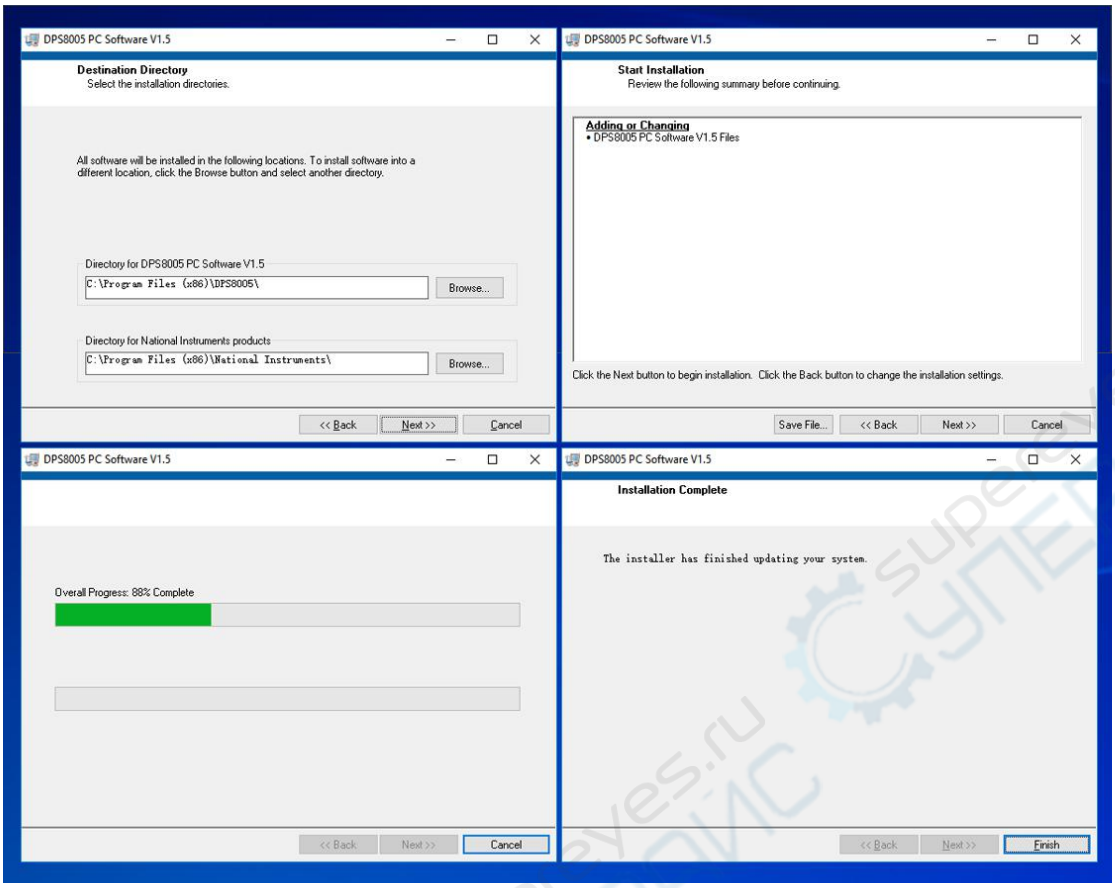


Double click the Arial Unicode MS Font Pack and click Install to install the Font Pack.



2.4.2 Double-click setup.exe to Set up Computer Software





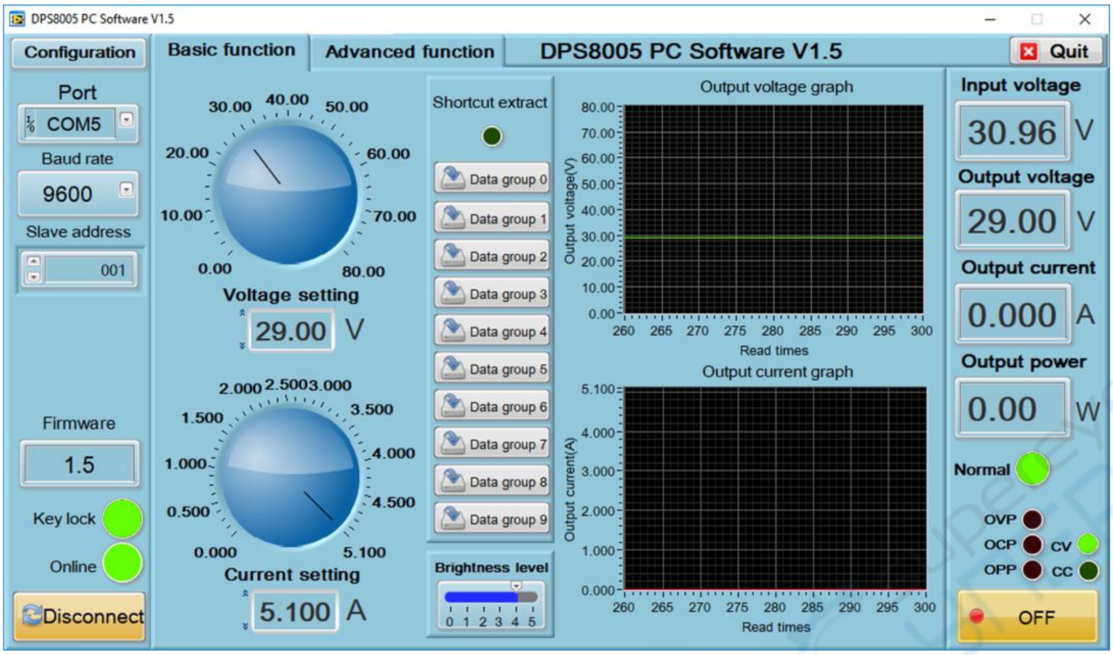
2.5 Using Computer Software

Double-click the shortcut icon on the desktop to open the computer software.



2.5.1 Introduction of Using

Select the communication port (section 2.3 for Bluetooth connection, section 2.1 for USB connection), baud rate, slave address (default 9600, 001), click "On-Line" to start communication, and automatically lock the digital power button after successful connection. Then "On-Line" will change into "disconnect". Click "Turn On" to turn on the output of the digital power supply," Turn On "will change into "Turn Off" when succeed.



2.5.2 Introduction of Functions

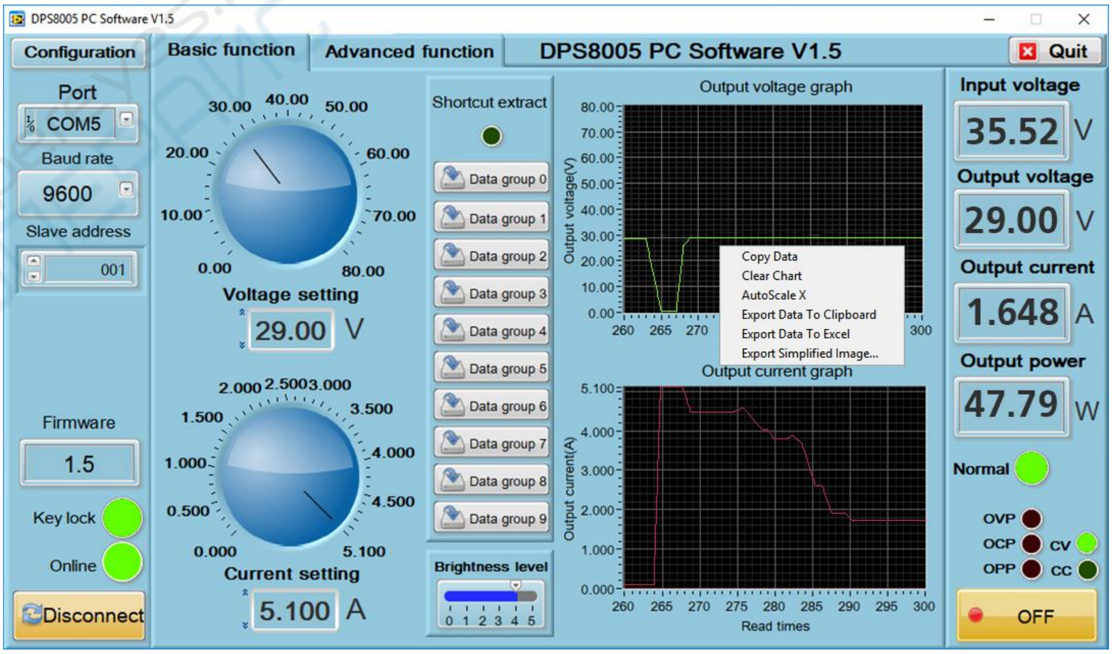
The computer software interface can be divided into basic functions and advanced functions.

Basic functions include Voltage/Current setting, shortcut recall, brightness adjustment, voltage and current curve derivation.

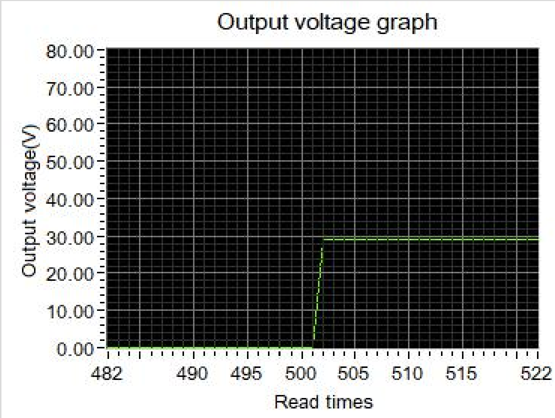
You can set Voltage/Current by turning the knob or enter an value. The graph on the right shows the real-time voltage and current curves (the curve will be stored for up to 24 hours).

Put the cursor on the Output Voltage curve table, right click and you can see functions below:

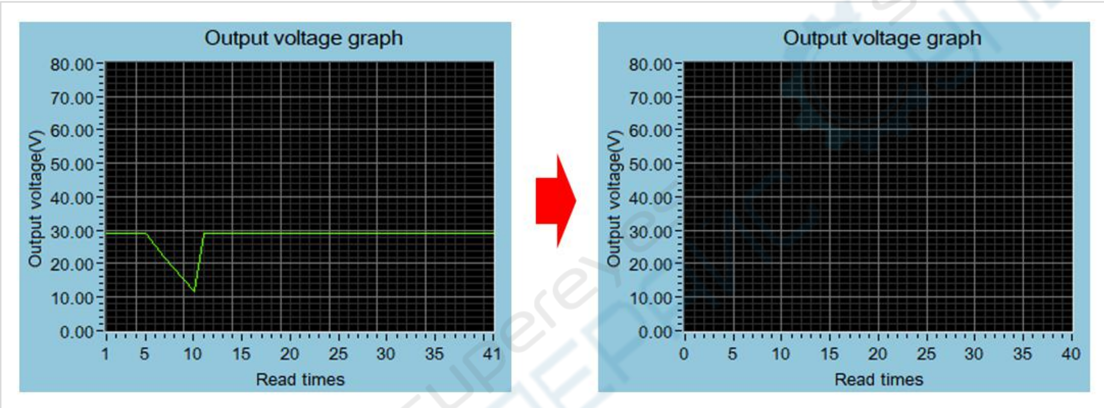
(Note: you can only right click on the table of DPS8005, others do not have this function)



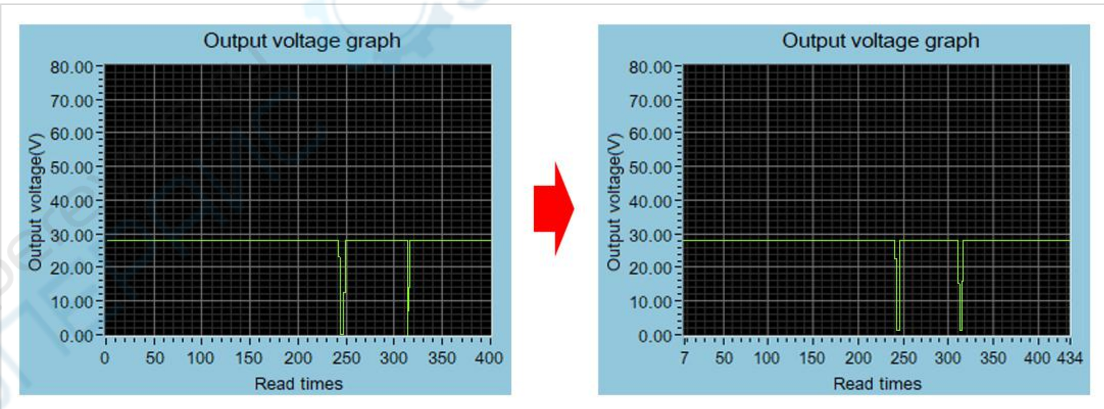
Data Copy will copy chart data as shown below:



Cleaning chart will clean chart data as shown below:

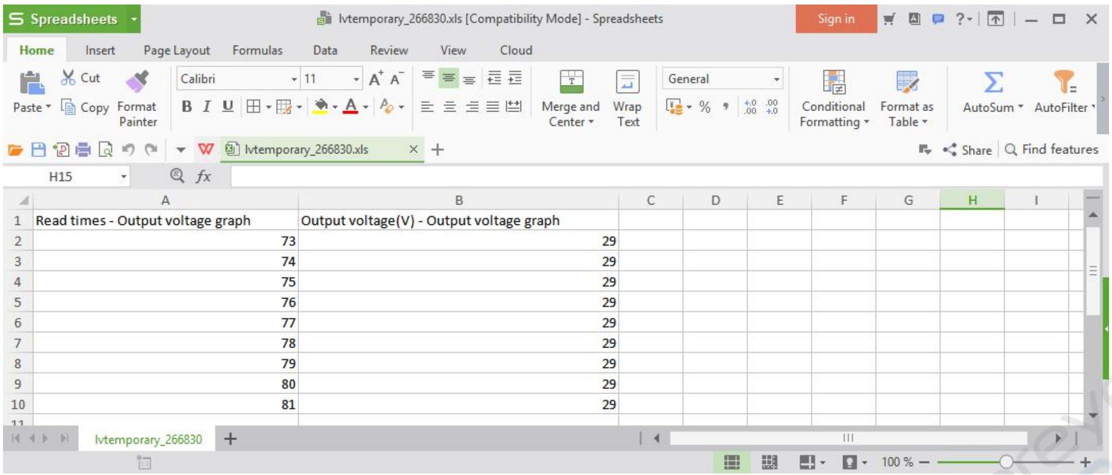


Automatic adjustment of the X scale will adjust the X-axis scale automatically, as shown below:

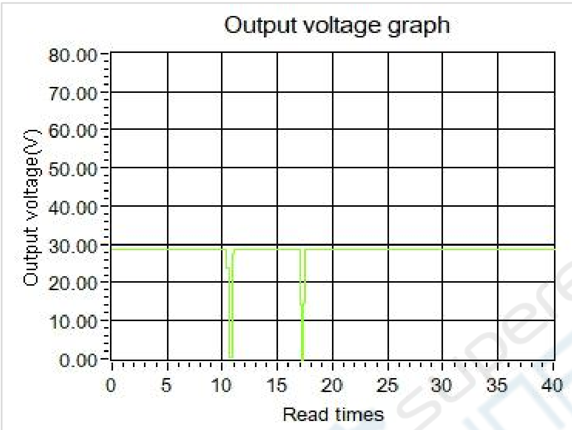


Exporting data to the clipboard will copy the data to the clipboard.

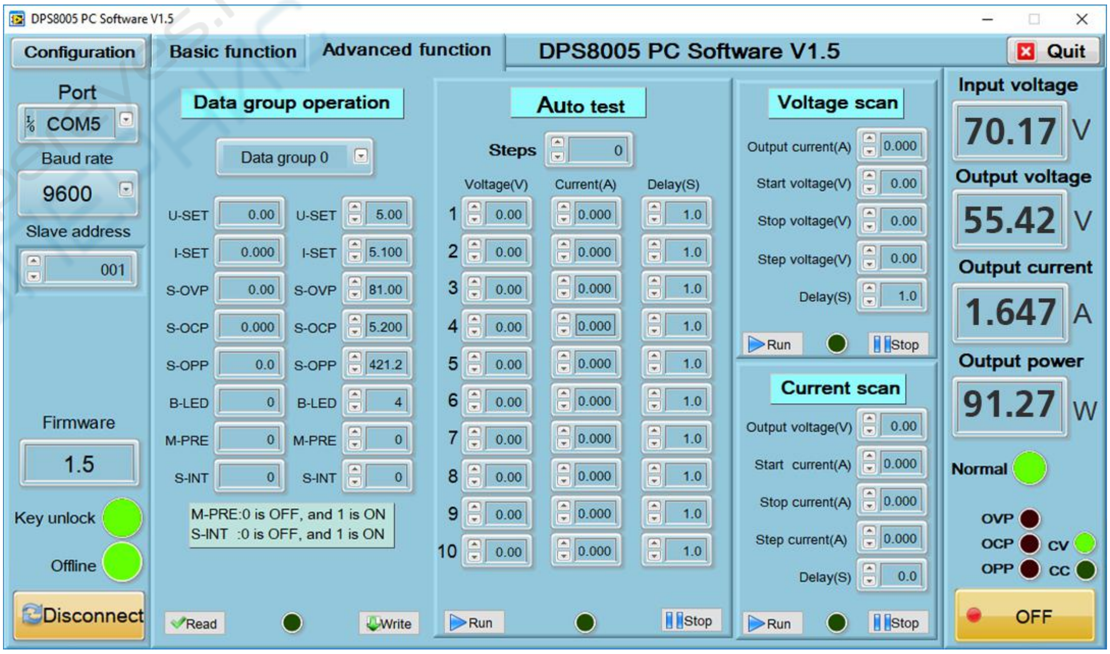
Exporting data to Excel will export data as table file as shown below:



Exporting simplified image as shown below:



Advanced functions include data group reading and writing, automatic test, voltage scan, current scan and so on.



3. Introduction of APP(Android)

Applicable product model: DPS5005-USB-BT/DPS8005-USB-BT.

3.1 Application Setup

SYSTEM: Android 5.0 or above

3.1.1 Application Download

The Android application has been uploaded to the Google Store, you can searched for "DPS(H) Series" in Google Store. Domestic customers who cannot use Google Store can also download the file with the extension APK and install it on the phone. You can get download address in section 2.4 .

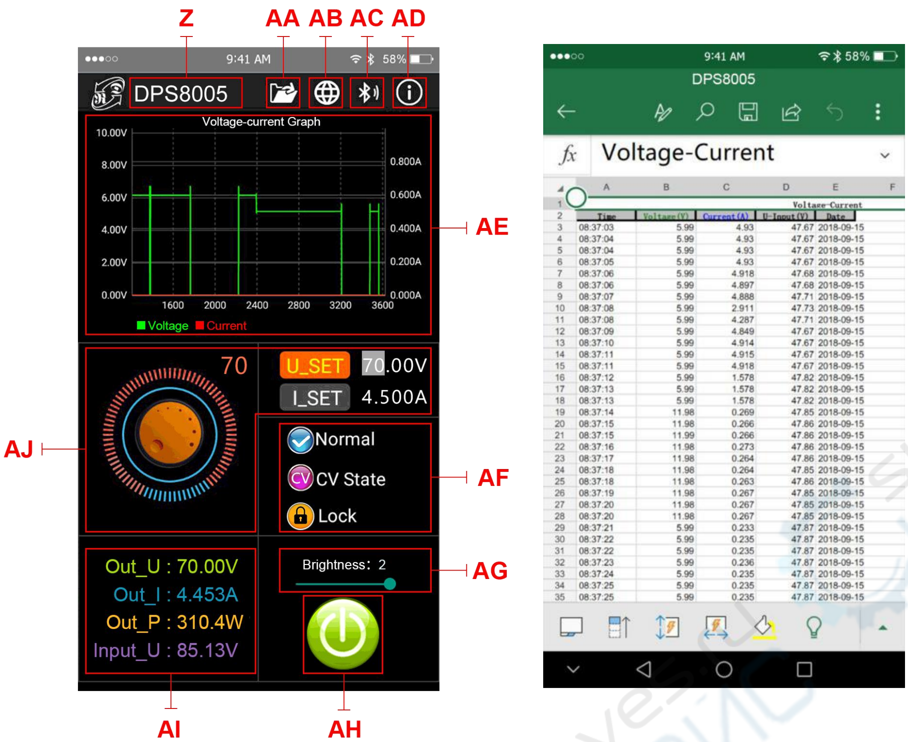
3.1.2 Application Setup

Android APP can only work in Android 5.0 or above. When installing the software, please approve permission that APP needs. If you need to record data for a long time, please turn off the power saving mode of the mobile phone and allow the APP to run in the background.

3.2 Icon (Setup Finished)



3.2.1 Click Icon You Can See Interface as Shown Below



Z: Digital power supply detected

AA: Export table file as shown above to the phone folder (SD Card directory, repeat the write, can generate a graph in Excel directly).

AB: Multi-language option, click to select a language, currently 3 languages (Chinese (Simplified / Traditional), English, more languages will be updated...

AC: Bluetooth connection, click to select model, search for "RuiDengDPS" or “DPS8005_001”,enter the pairing code 1234 and click on the "connection” button (or connect the Bluetooth on the phone first, then turn on the app Bluetooth connection to connect to the Bluetooth directly

AD: program information, Version number description, assistance developer information

AE: Voltage/Current measurement graph

AF: output status  ; constant voltage / constant current state  ;keypad status 

AG: screen brightness, adjust the brightness from 0 to 5 where 0 is the darkest and 5 is the brightest

AH: Output ON/OFF status

AI: Output voltage, output current, output power, input current detected value

AJ: value of preset output voltage, output current, select U_SET or I_SET, turn the Analog rotary control clockwise increases the value and anticlockwise decreases the value.

4.Others

APP for IOS has not been finished .You can send E-Mail to 1749808860@qq.com if you have any question.